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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/561,093

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EXAMINER

EDWARDS, LOREN C

ART UNIT

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3748

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/561,093	Applicant(s) ALLANSSON ET AL.	
	Examiner LOREN C. EDWARDS	Art Unit 3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5,7-12,14,16,17,19-21,23,25 and 26 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5,7-12,14,16,17,19-21,23,25 and 26 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

1. An Applicant's Amendment filed on 6/6/08 has been entered. Claims 4, 6, 13, 15, 18, 22, and 24 have been canceled; claims 1, 2, 9, 11, 14, 16, 17, and 19 have been amended; and claims 25 and 26 have been added. Overall, claims 1-3, 5, 7-12, 14, 16, 17, 19-21, 23, 25, and 26 are pending in the application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1-3, 5, 7-12, 14, 16, 19-21, 23, 25, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bromberg et al. (U.S. 6,560,958) in view of Bromberg et al. (U.S. 5,409,784). Bromberg discloses a method of treating an exhaust gas of a lean-burn reciprocating engine containing NO_x (Col. 1, Line 54 – Col. 2, Line 11), which method comprising sorbing said NO_x on at least one NO_x sorber when the exhaust gas is lean (Fig. 1, No. 32; Col. 3, Lines 9-14), intermittently contacting the at

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least one NO_x sorber with a reductant comprising hydrocarbon effective to convert NO_x to N₂ thereby to regenerate the at least one NO_x sorber (Col. 3, Lines 14-20) and feeding effluent of the intermittent contacting step to the engine inlet (Fig. 1, No. 36; Col. 3, Lines 20-30) and further comprising, during regeneration, injecting the reductant to the exhaust gas at an inlet of the at least one NO_x sorber to convert NO_x to N₂ (Fig. 1, Nos. 24 and 32). The Bromberg (5,409,784) reference has been relied upon to show that hydrocarbon will remain in the reductant produced by the Plasma fuel converter (Fig. 13, downstream results of plasmatron 10; Col. 9, Lines 35-68), and therefor the claimed invention is not distinguishable.

5. With regards to claim 2, Bromberg discloses the method of claim 1, as described above, and further wherein the sorbing step comprises simultaneously contacting the lean exhaust gas with at least two NO_x sorbers arranged in parallel (Fig. 3, No. 32 and 42), and wherein the intermittently contacting step comprises intermittently contacting fewer than all of the at least two NO_x sorbers simultaneously with said reductant (Col. 4, Lines 18-32).

6. With regards to claim 3, Bromberg discloses the method of claim 1, as described above, and further wherein the exhaust gas flow through the at least one NO_x sorber being regenerated during the intermittently contacting step is less than in a NO_x sorber not being regenerated (Col. 4, Lines 18-32), wherein substantially all of the effluent from the at least one NO_x sorber being regenerated by the intermittent contacting step is fed to the engine inlet (Fig. 1, No. 36; Col. 3, Lines 42-55).

7. With regards to claim 5, Bromberg discloses the method of claim 1, as described above, and further wherein the hydrocarbon is engine fuel (Fig. 1, No. 18; Col. 3, Lines 5-8).

8. With regards to claim 7, Bromberg discloses the method of claim 1, as described above, and further comprising catalytically oxidizing HC and CO to steam, CO₂, and/or NO to NO₂ upstream of the at least one NO_x sorber (Col. 2, Lines 58-67).

9. With regards to claim 8, Bromberg discloses the method of claim 7, as described above, and further comprising collecting particulate matter between the step of NO oxidation and the step of NO_x sorption (Col. 4, Line 66 – Col. 5, Line 14).

10. With regards to claim 9, Bromberg discloses a lean-burn reciprocating engine (Col. 1, Line 54 – Col. 2, Line 11) emitting exhaust gas containing NO_x and having a treatment system comprising at least one NO_x sorber (Fig. 1, No. 32; Col. 3, Lines 9-14) for sorbing NO_x when the exhaust gas is lean, means for intermittently contacting the at least one NO_x sorber with a reductant comprising hydrocarbon (Bromberg 5,409,784; Fig. 13, downstream results of plasmatron 10; Col. 9, Lines 35-68) effective to convert NO_x to N₂ to regenerate the at least one NO_x sorber (Col. 3, Lines 14-20) and means for feeding effluent from the intermittently contacting step to an engine inlet (Fig. 1, No. 36; Col. 3, Lines 20-30) wherein the at least one NO_x sorber is associated with injector means for introducing the reductant to the exhaust gas at an inlet of the at least one NO_x sorber during regeneration (Fig. 1, Nos. 24 and 32).

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11. With regards to claim 10, Bromberg discloses the engine of claim 9, as described above, and further comprising exhaust gas recirculation means for use in normal or occasional modes of operation (Fig. 1, No. 36; Col. 3, Lines 20-30).

12. With regards to claim 11, Bromberg discloses the engine of claim 9, as described above, and further wherein the at least one NO_x sorber comprises at least two NO_x sorbers arranged in parallel (Fig. 3, No. 32 and 42), and further comprising a means for selectively contacting fewer than all of the at least two NO_x sorbers with the reductant (Col. 4, Lines 18-32).

13. With regards to claim 12, Bromberg discloses the engine of claim 11, as described above, and further comprising means for reducing an exhaust gas flow to one of the at least two NO_x sorbers when the one of the at least two NO_x sorbers is being regenerated relative to an exhaust gas flow to another NO_x sorber not being regenerated (Col. 4, Lines 18-32), and means for feeding to the engine inlet substantially all of an effluent from the one of the at least two NO_x sorbers being regenerated (Fig. 1, No. 36; Col. 3, Lines 42-55).

14. With regards to claim 14, Bromberg discloses the engine of claim 9, as described above, and further wherein the agent comprises a supply of hydrocarbon (Fig. 1, No. 18; Col. 3, Lines 5-8).

15. With regards to claim 16, Bromberg discloses the engine of claim 14, as described above, and further wherein the hydrocarbon is engine fuel (; Col. 5, Lines 17-19).

16. With regards to claim 19, Bromberg discloses the engine of claim 9, as described above, and further comprising means for controlling the intermittent regeneration of the at least one NOx sorber and a means for feeding the effluent from at least one NOx sorber being regenerated to the engine inlet (Fig. 1, No. 36; Col. 3, Lines 20-30; Col. 3, Lines 43-55), wherein the amount of reductant released into the atmosphere is reduced relative to a similar engine lacking the means for feeding the effluent from the at least one NOx sorber being regenerated to the engine inlet.

17. With regards to claim 20, Bromberg discloses the engine of claim 9, as described above, and further wherein the system further comprises an oxidation catalyst disposed upstream of the at least one NOx sorber for catalyzing the oxidation of HC and CO to steam and CO₂ and/or NO to NO₂ (Col. 2, Lines 58-67).

18. With regards to claim 21, Bromberg discloses the engine of claim 9, as described above, and further wherein the system further comprises a particulate matter filter located between the NO oxidation catalyst and the at least one NOx sorber (Col. 4, Line 66 – Col. 5, Line 14).

19. With regards to claim 23, Bromberg discloses the engine of claim 10, as described above, and further wherein the EGR means comprises a pump (Fig. 1, No. 26 – engine is a pump).

20. With regards to claim 25, Bromberg discloses the method of claim 3, as described above, and further wherein the exhaust gas flow through the at least one NOx sorber being regenerated during the intermittently contacting step is a fraction of the total exhaust gas flowing (Fig. 1 – Gas in No. 32 is a fraction of the total exhaust gas).

21. With regards to claim 26, Bromberg discloses the engine of claim 12, as described above, and further wherein the means for reducing an exhaust gas flow to the one of the at least two NO_x sorbers being regenerated is a fraction of the total exhaust gas flowing (Fig. 1 – Gas in No. 32 is a fraction of the total exhaust gas).

22. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bromberg. Common rail fuel injection is notoriously well known in the art so as to be proper for official notice.

Response to Arguments

23. Applicant's arguments with respect to claims 1 and 9 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

24. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LOREN C. EDWARDS whose telephone number is (571)272-2756. The examiner can normally be reached on M-TH 5:30-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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